

Statewide Seasonal Fire Danger Assessment – May 2023 Update

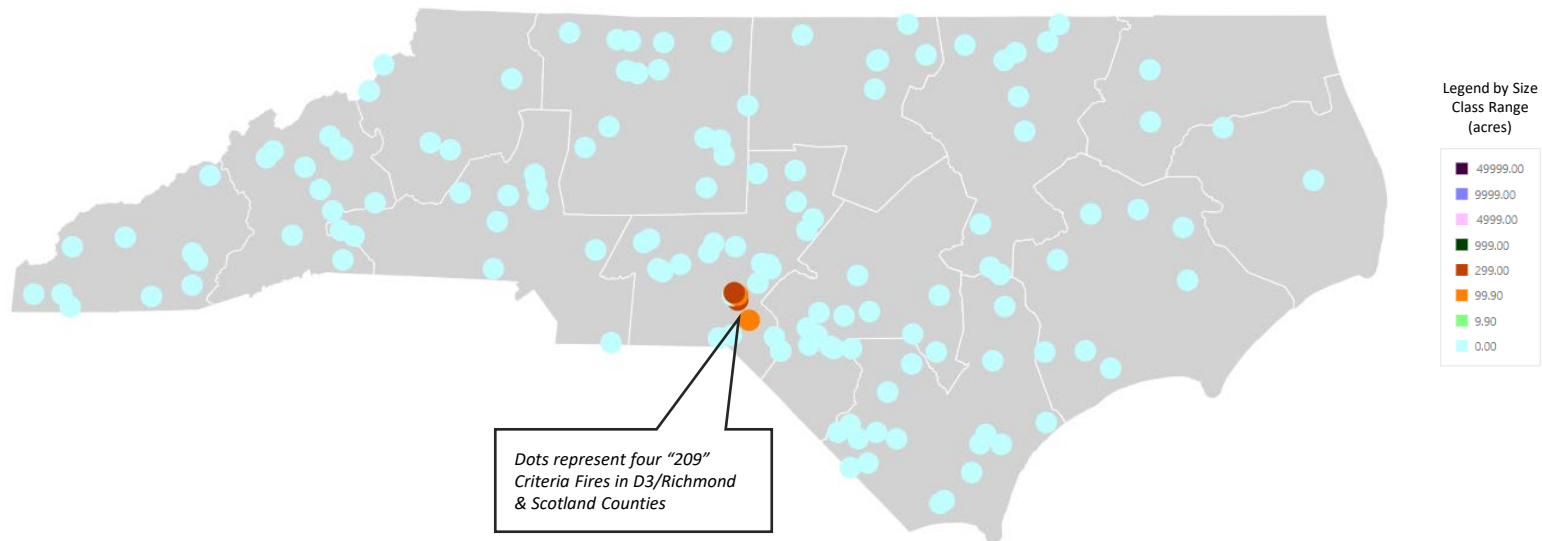
Created by: Jamie Dunbar
Fire Environment Staff Forester
NC Forest Service

Month to Date Incident Activity

fiResponse Incident Location Map (for general context)

Date Range: 5/1 – 5/10, 2023

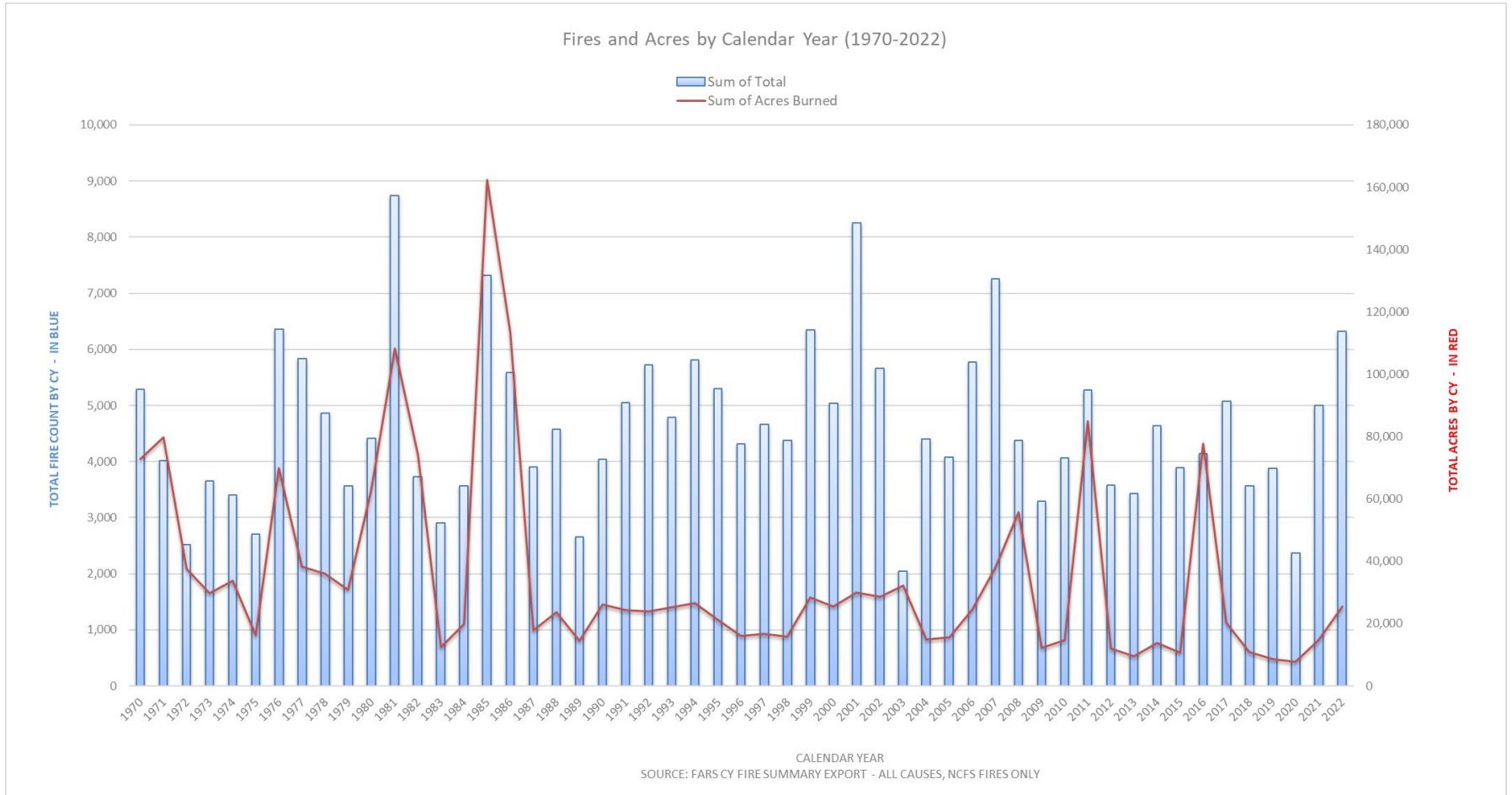
Report: Business Intelligence Module, Response Trends Map



Current Incident Specific Information for Great Lakes Fire (D4/Craven & Jones):

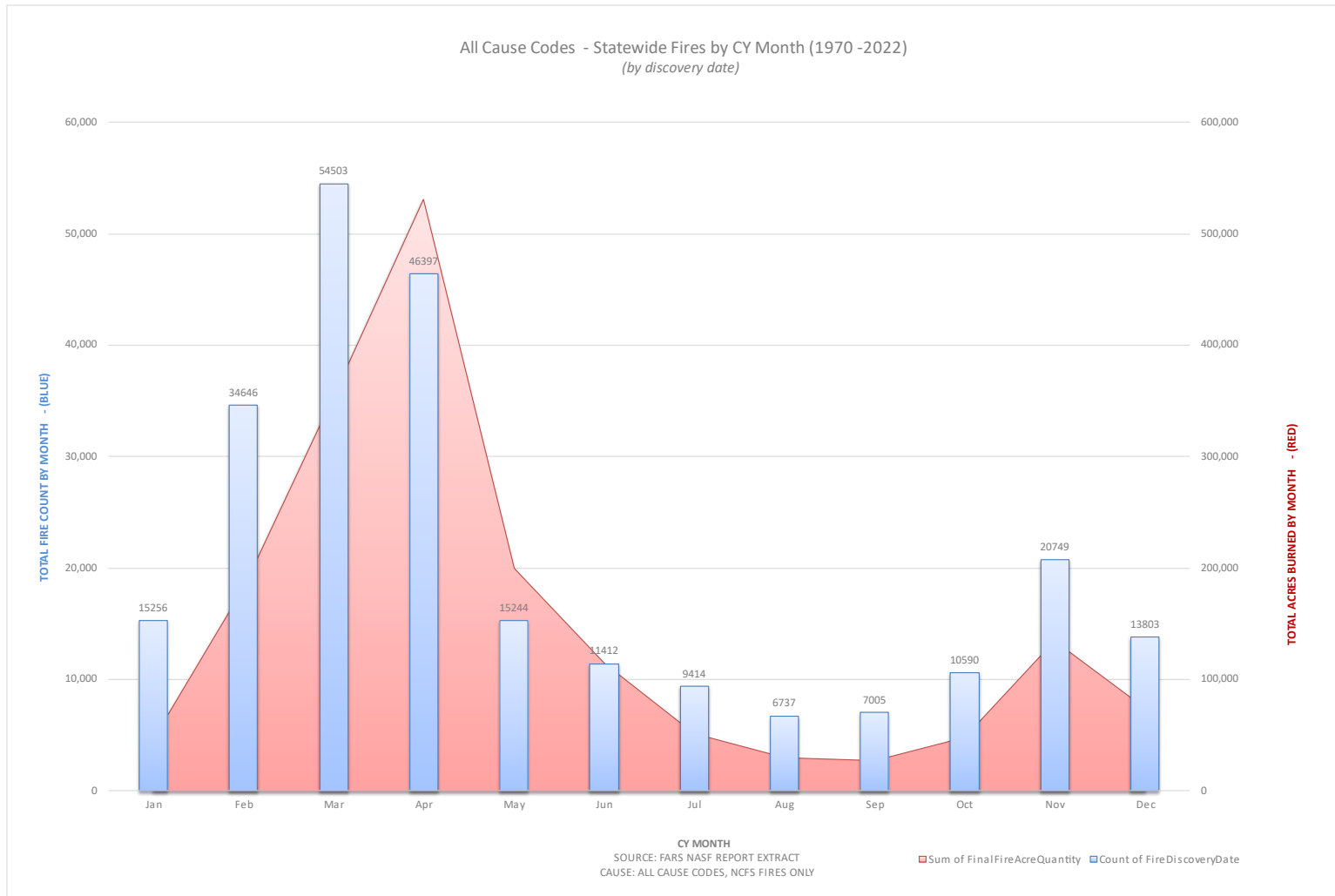
<https://inciweb.wildfire.gov/incident-information/ncncf-great-lakes>

Looking Back: All Fire Activity **by CY** from 1970 - 2022



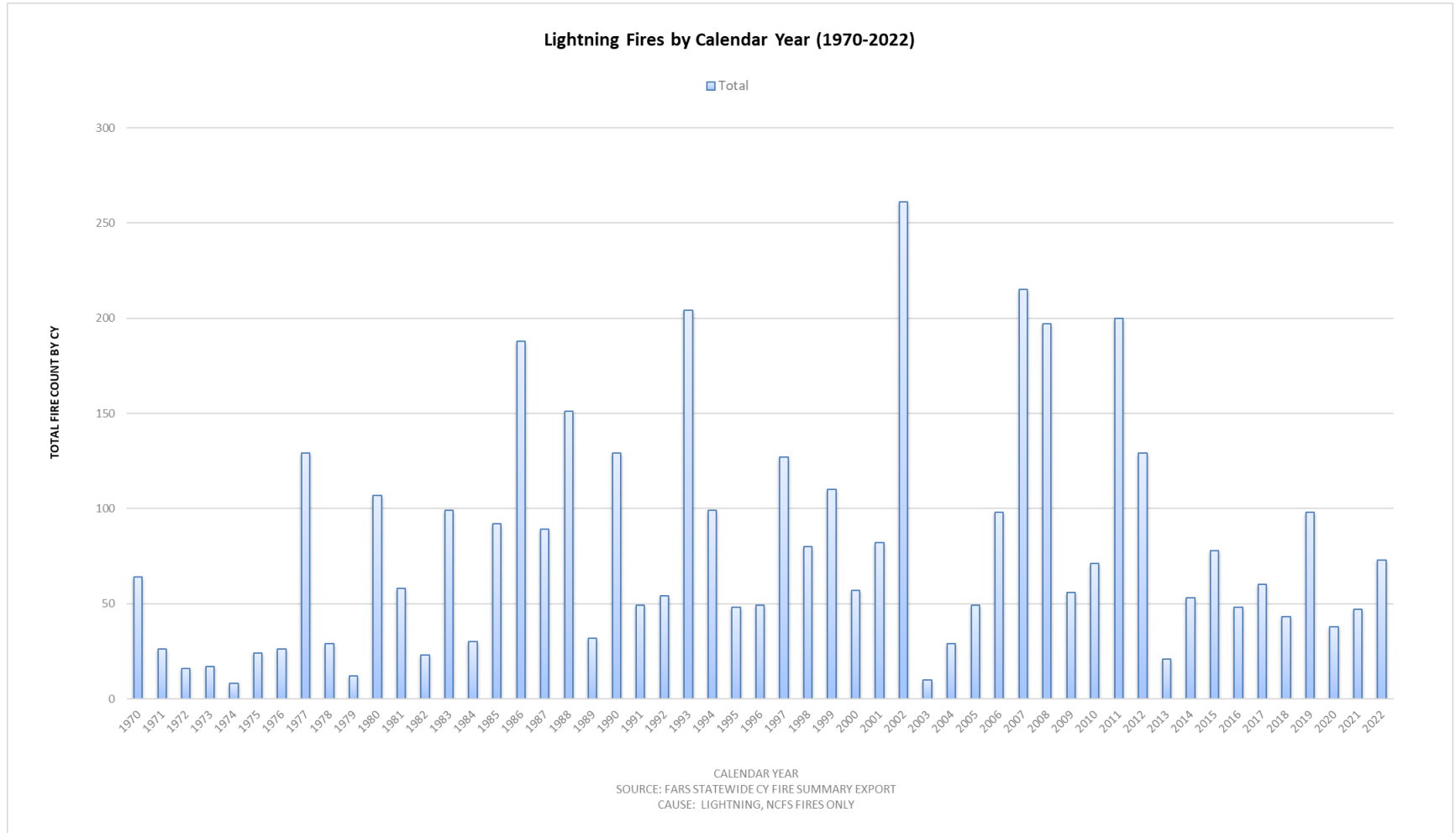
All Cause Codes, Statewide, NCFS Reported Fires Only

Distribution of All Fires by Month from 1970 - 2022



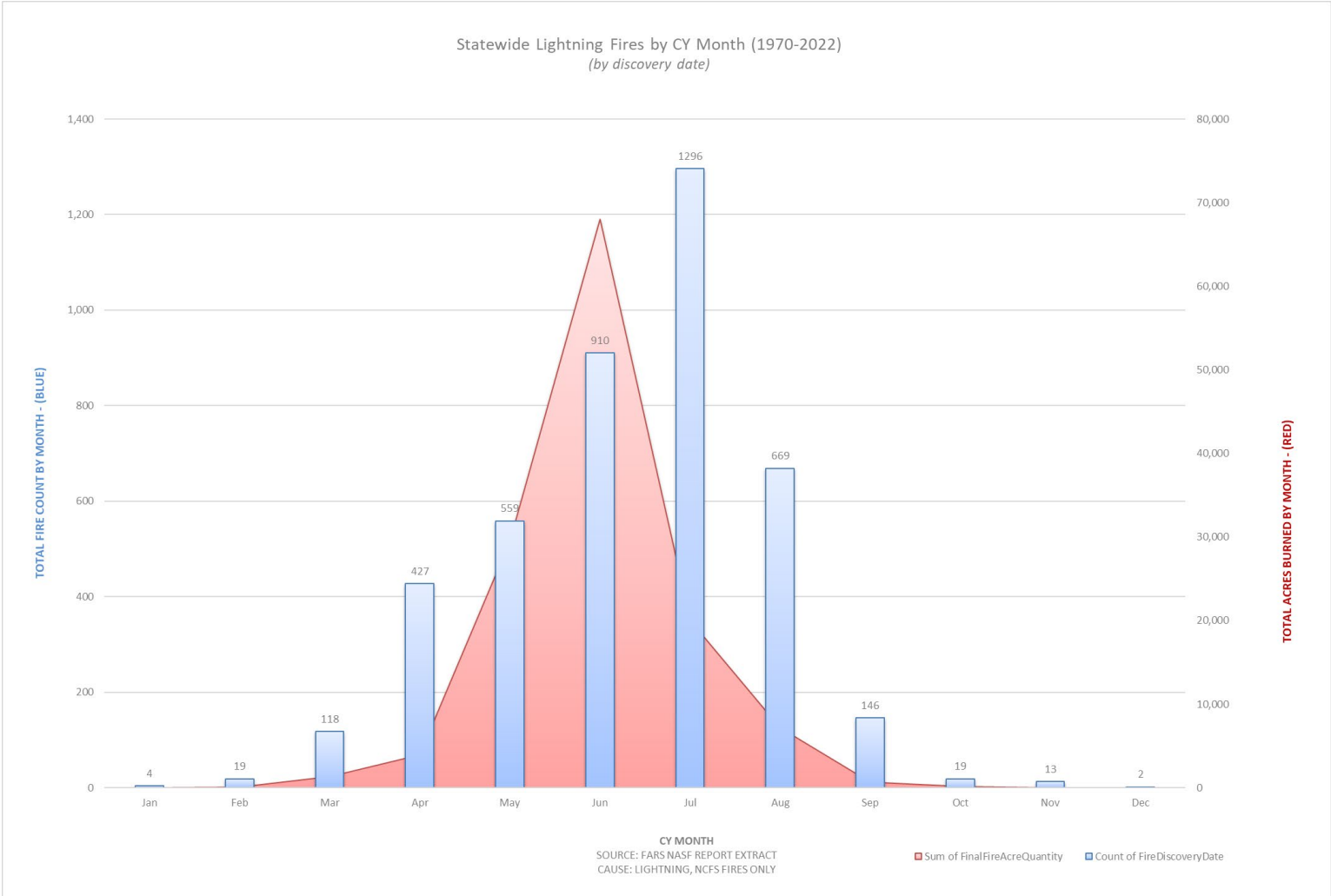
Cause: All Cause Codes, Statewide, NCF5 Reported Fires Only

Looking Back: Distribution of **Lightning Fires by CY** from 1970 - 2022



Cause: Lightning, Statewide, NCFS Reported Fires Only

Distribution of **Lightning Fires by Month** from 1970 - 2022



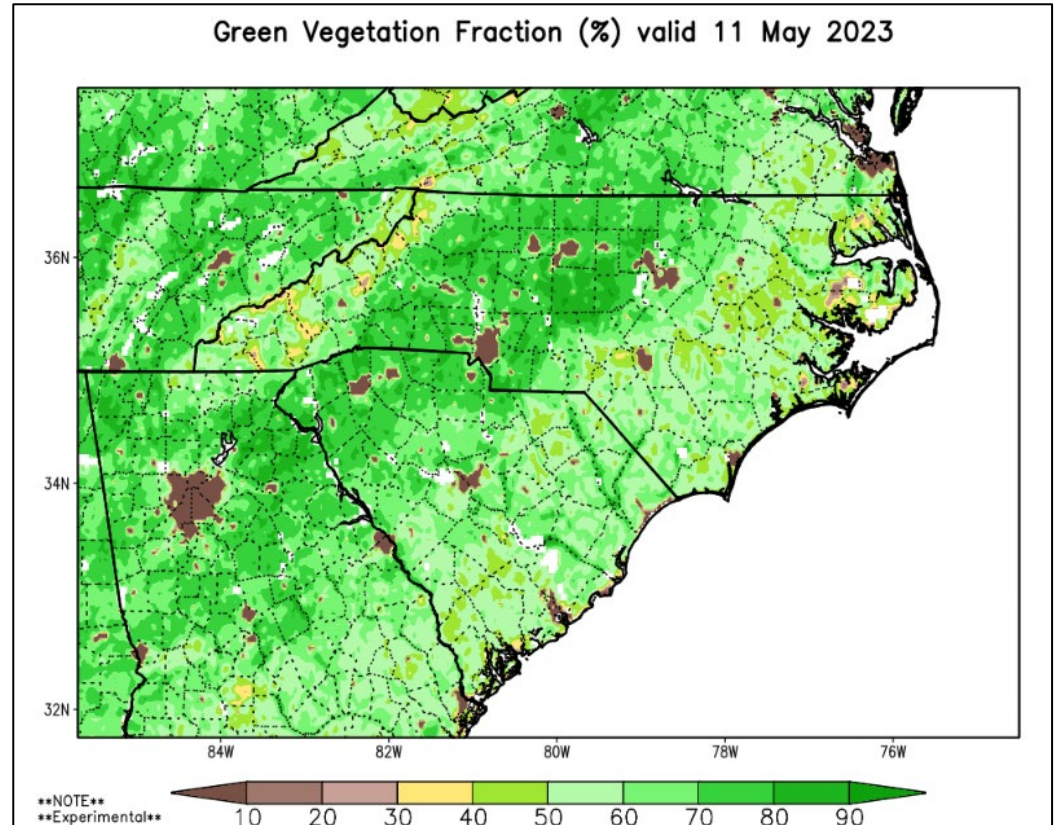
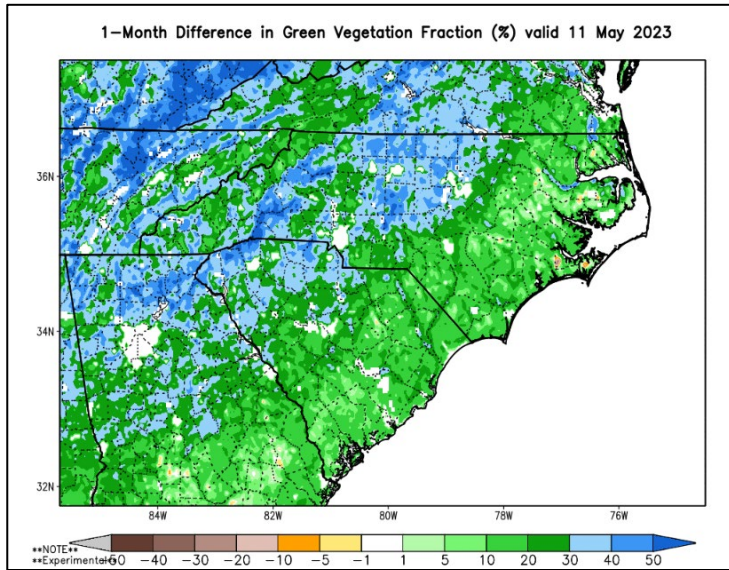
Cause: Lightning, Statewide, NCFS Reported Fires Only

Fire Environment Slides

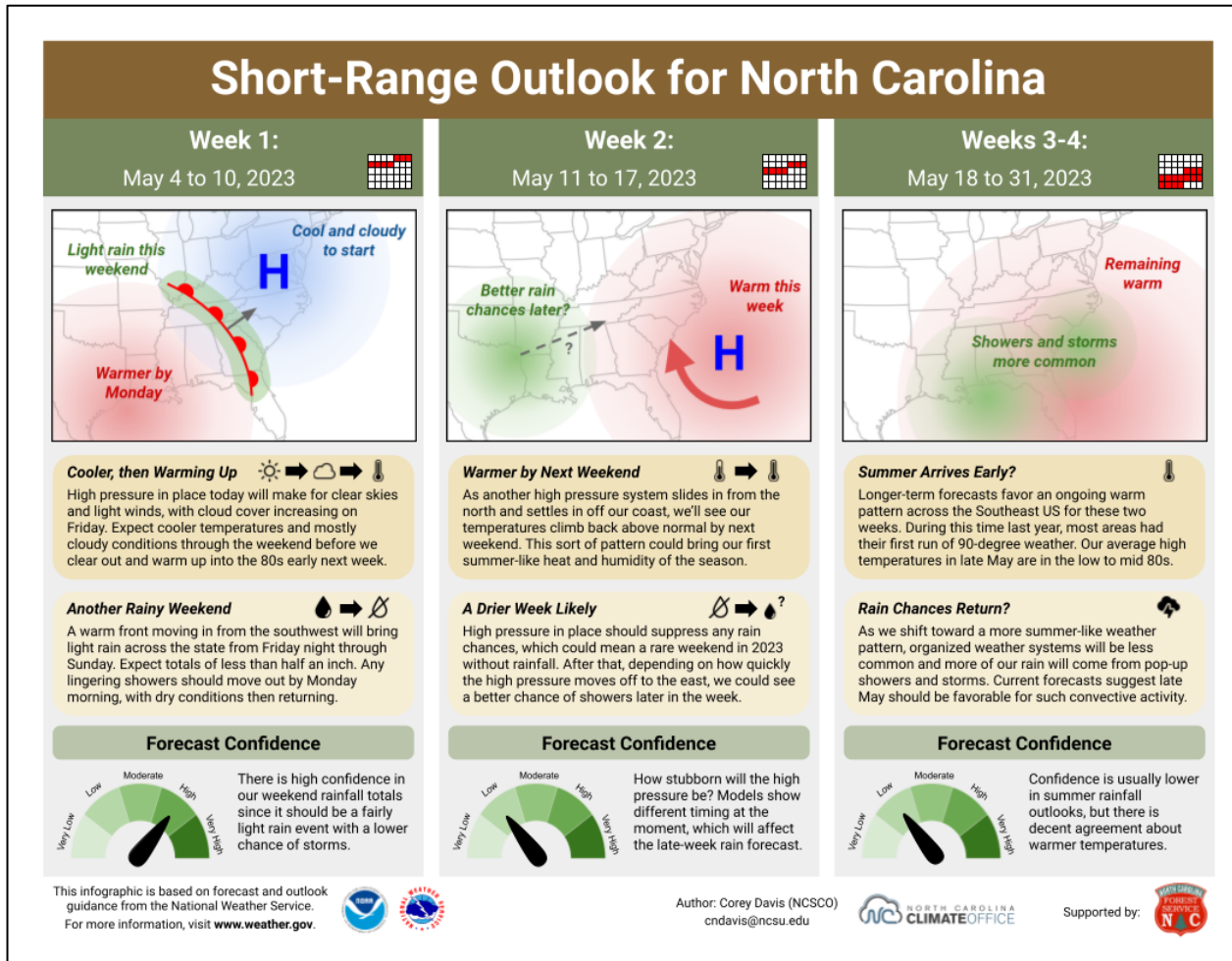
Modeled Green Vegetation Fraction

Note continued higher elevation green-up.

Pocosin/Bay waxy type species continue to develop.

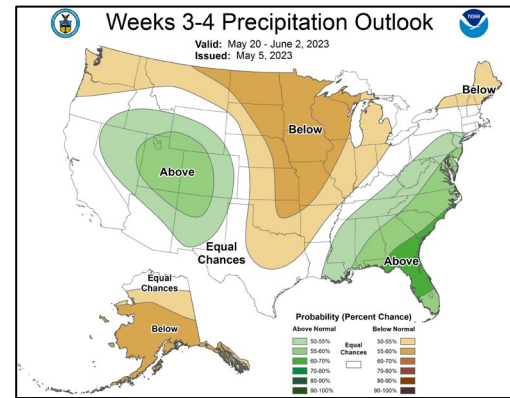
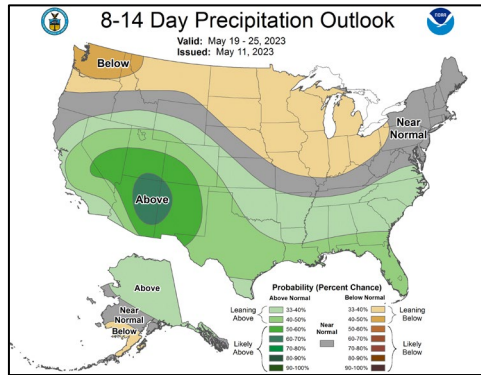
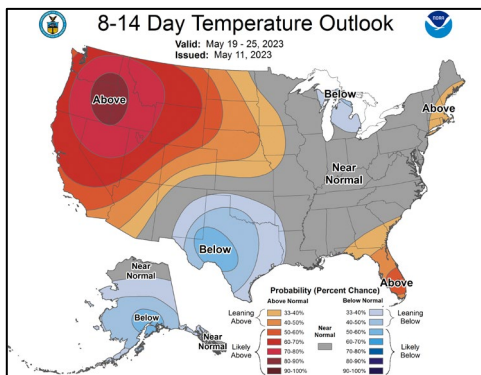
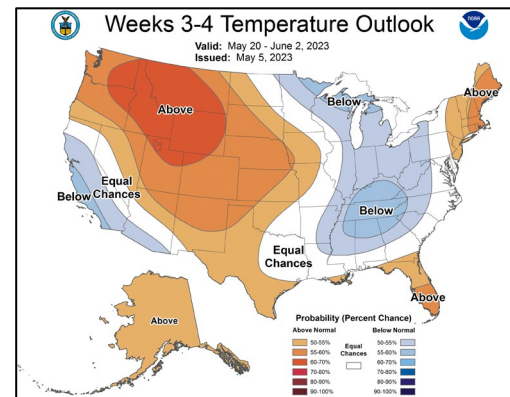
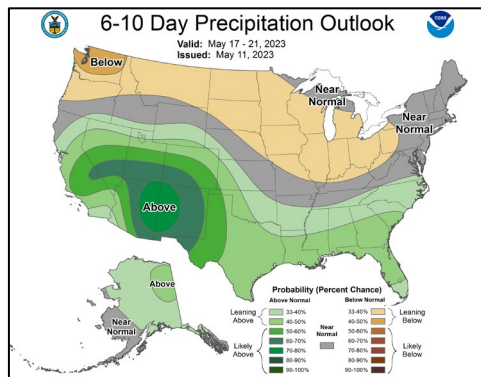
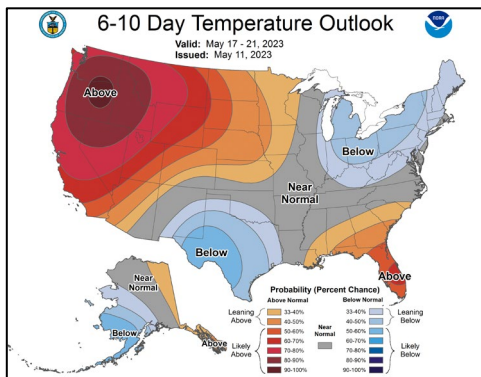


State Climate Office: Short-Range Monthly Outlook for NC

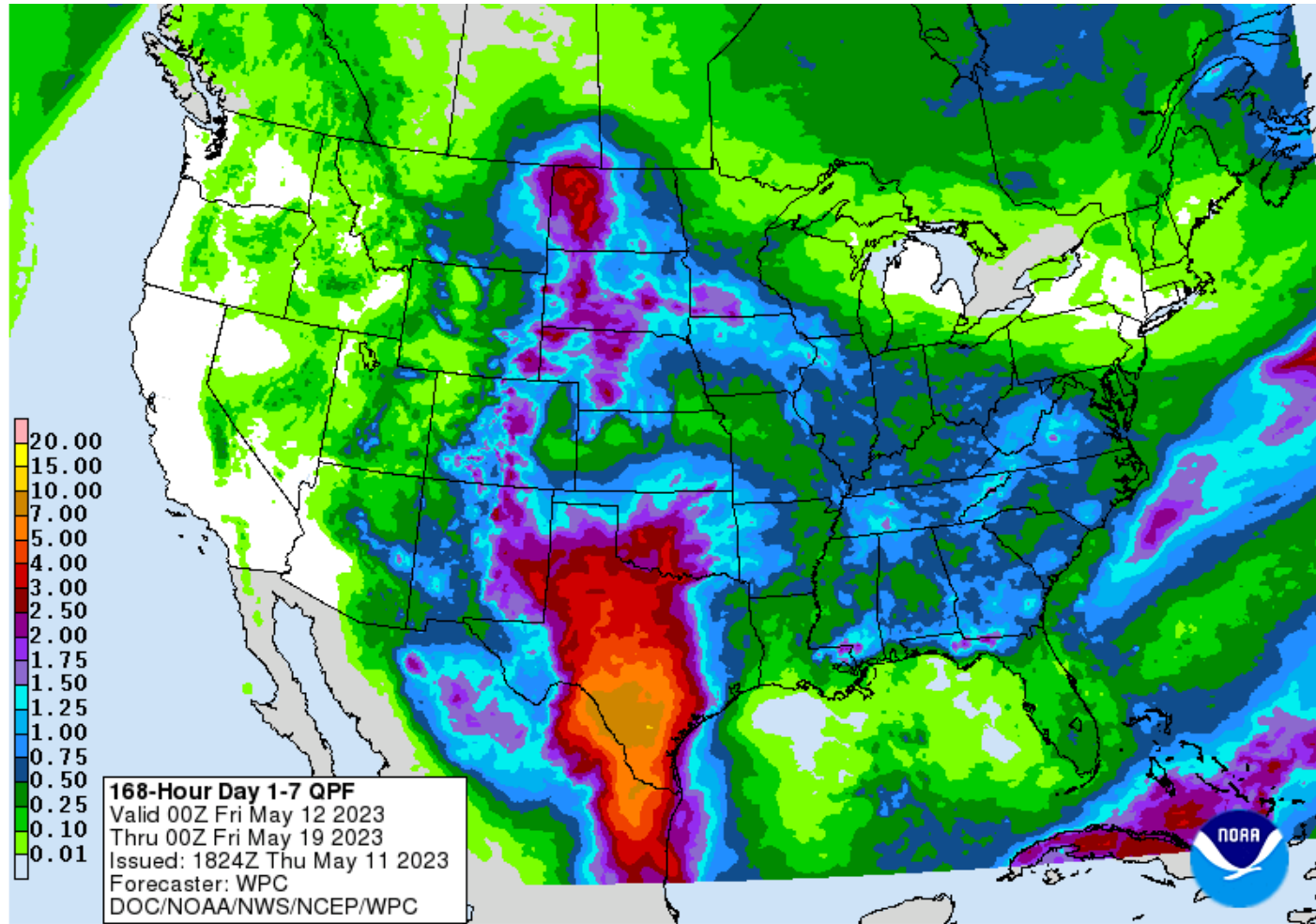


Temp & Precip Outlook

6-10 Day, 8-14 Day & 3-4 Week



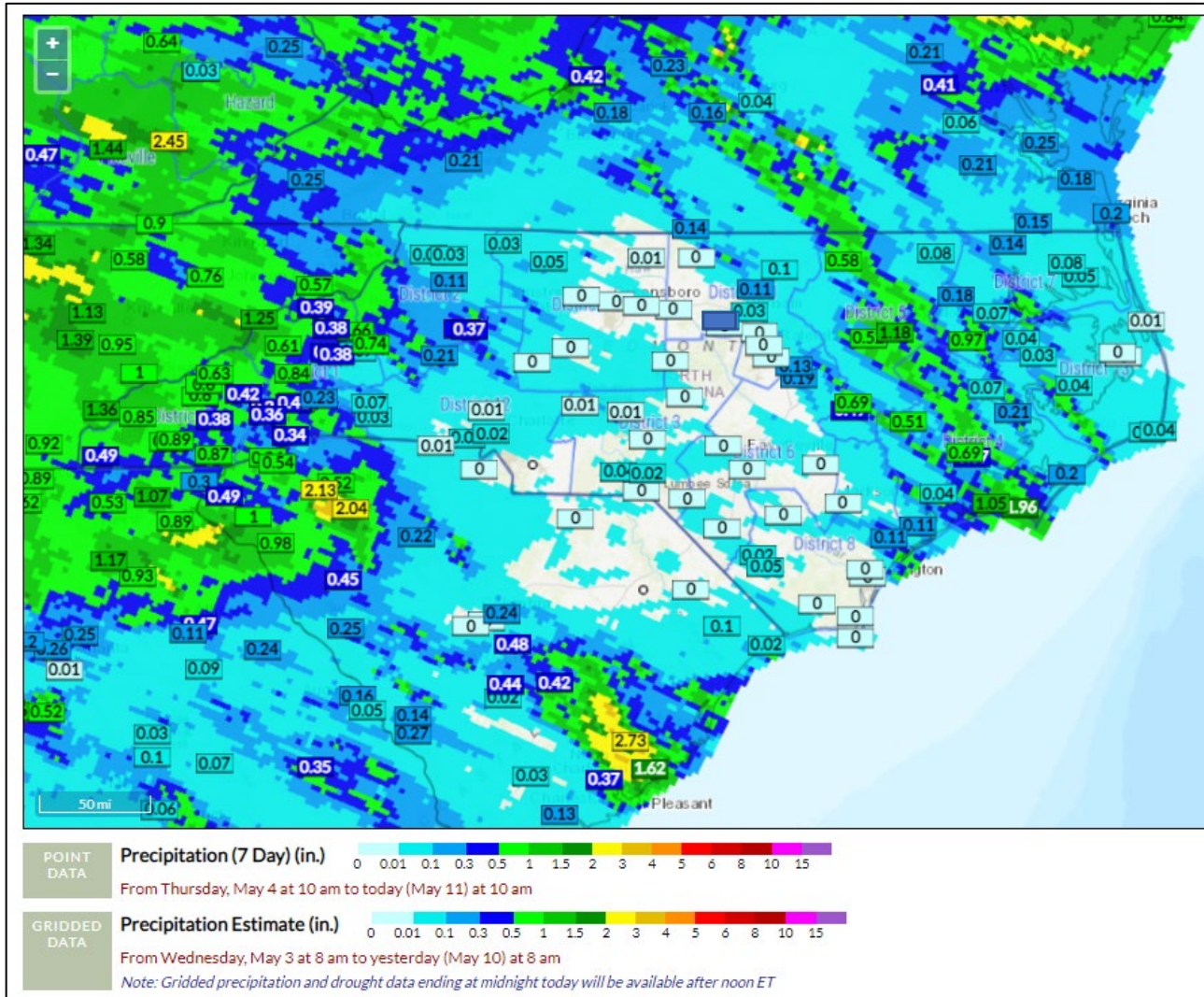
Quantitative Precipitation Forecast, 7-Day



Location: <https://www.wpc.ncep.noaa.gov/#>

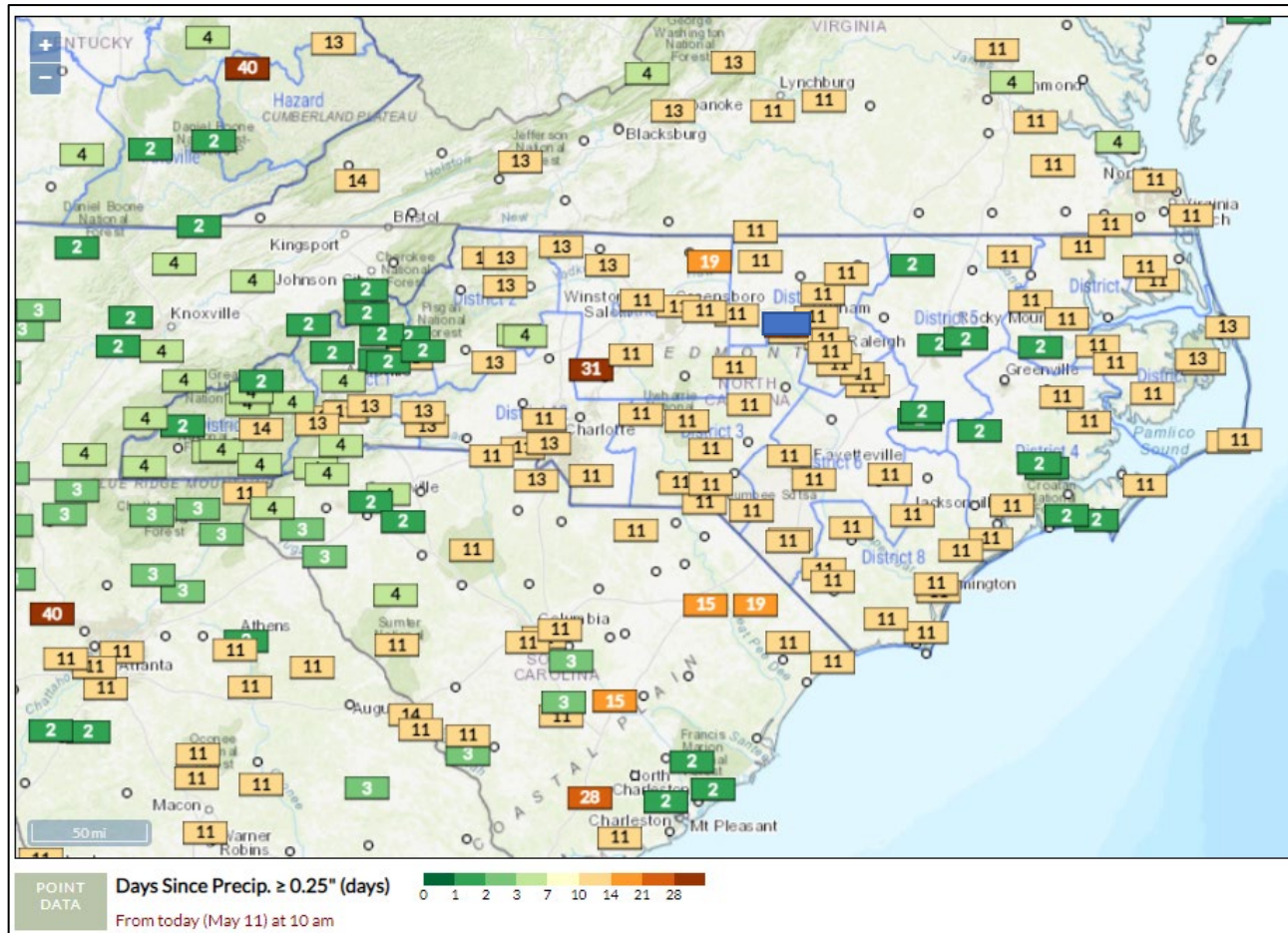
7 Day Precipitation Totals

FWIP (Point accumulation ending at 1000 on 5/11, Grid ending 0800 5/10)



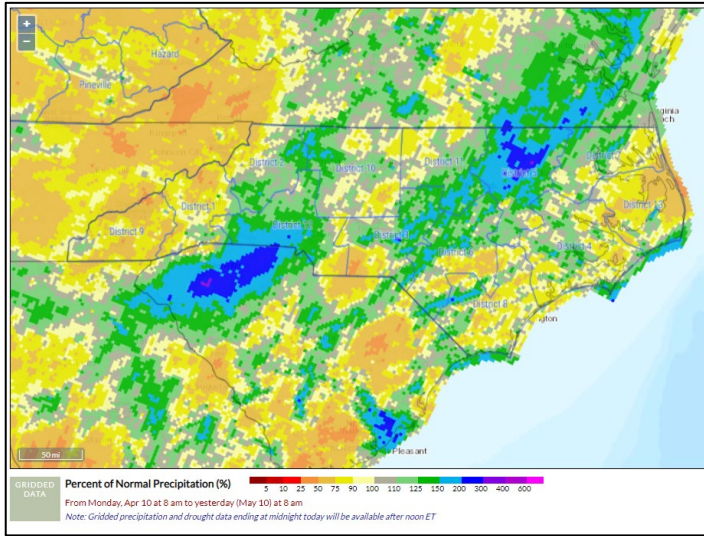
Days Since Precip $\geq 0.25''$

FWIP (Point calculation ending at 1000 on 5/11)

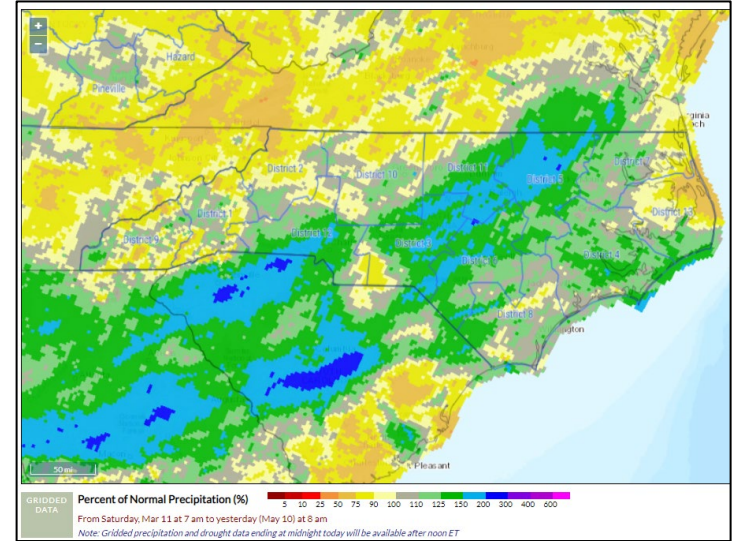


Percent of Normal Precip, FWIP (Ending 0800 5/10)

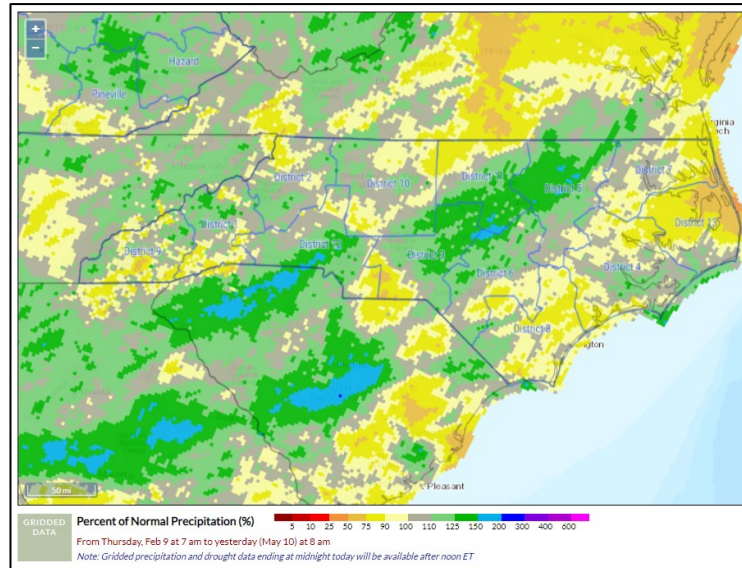
30-Day % of Normal



60-Day % of Normal

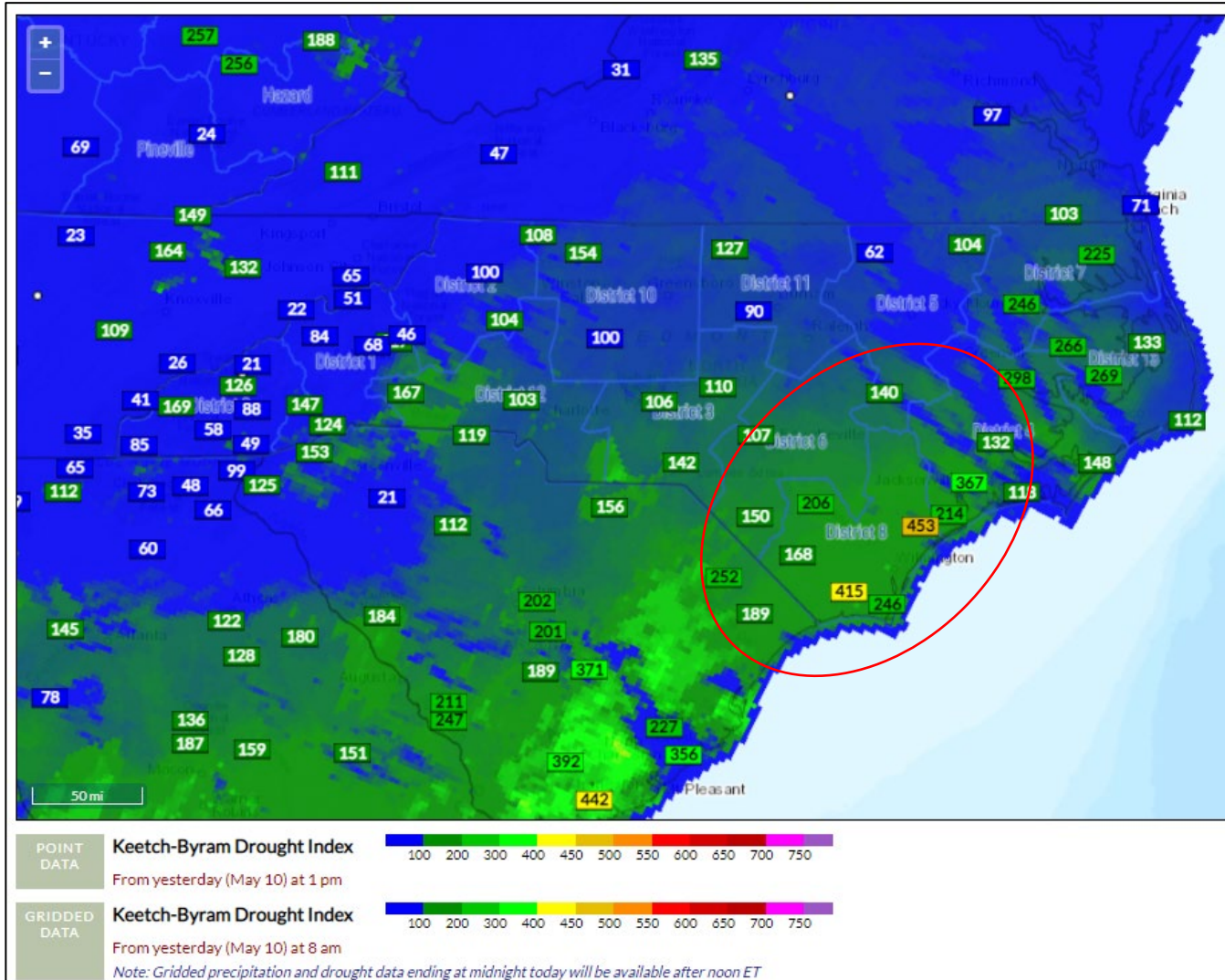


90-Day % of Normal



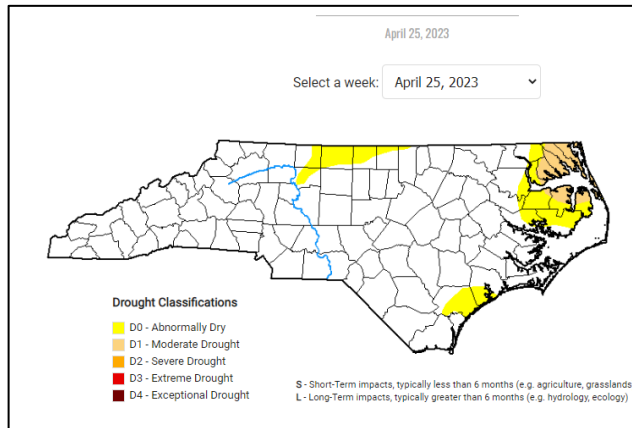
KBDI - Gridded & Station Points

FWIP (Point calculation from 1300 on 5/10, Grid ending 0800 5/10)

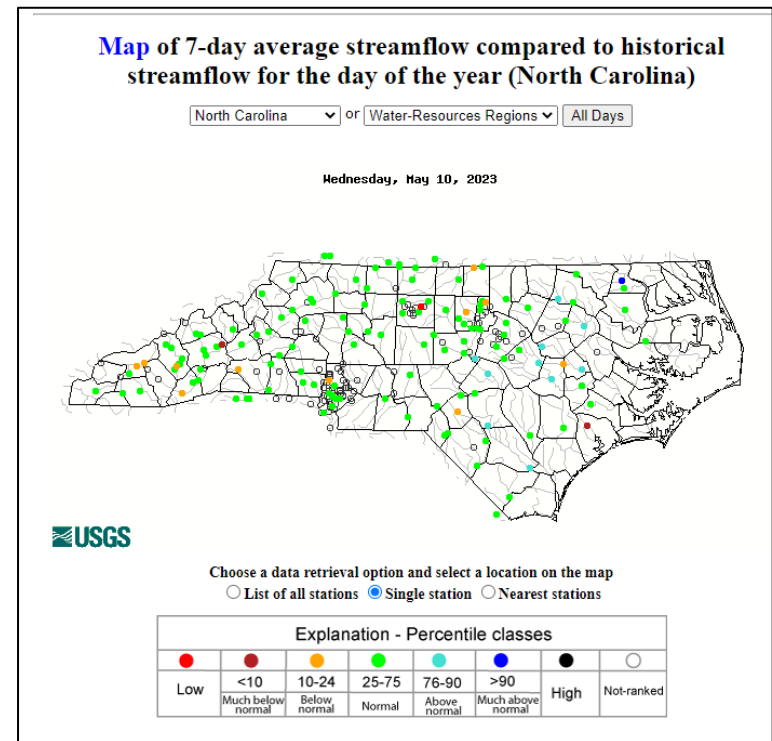
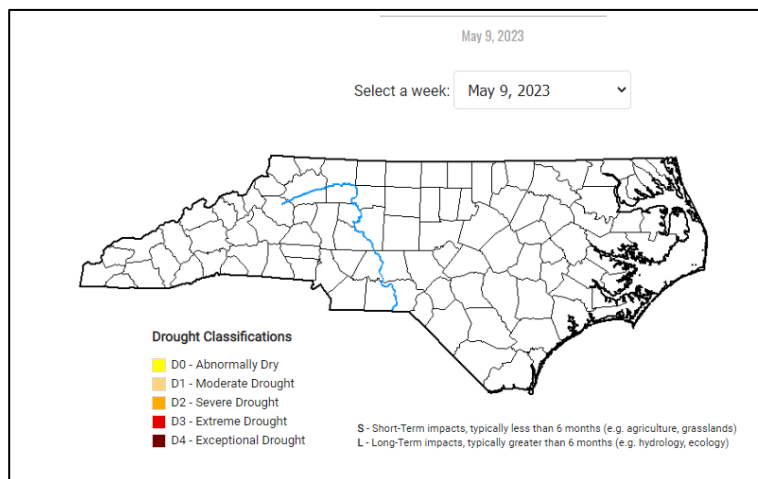


Drought Situation

Two Weeks Ago:



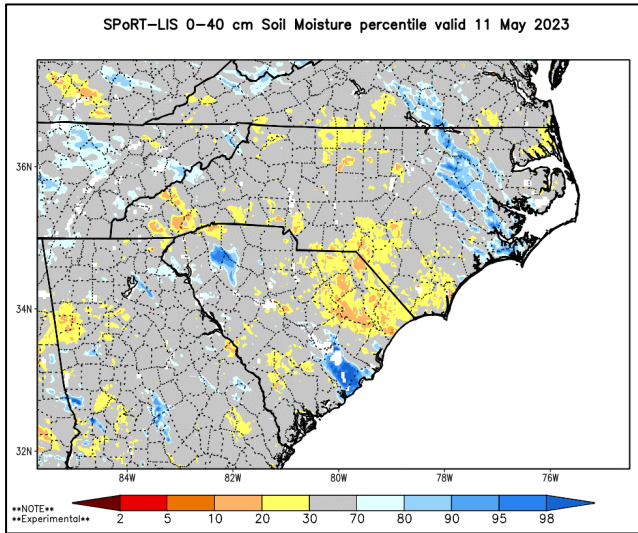
Current Week:



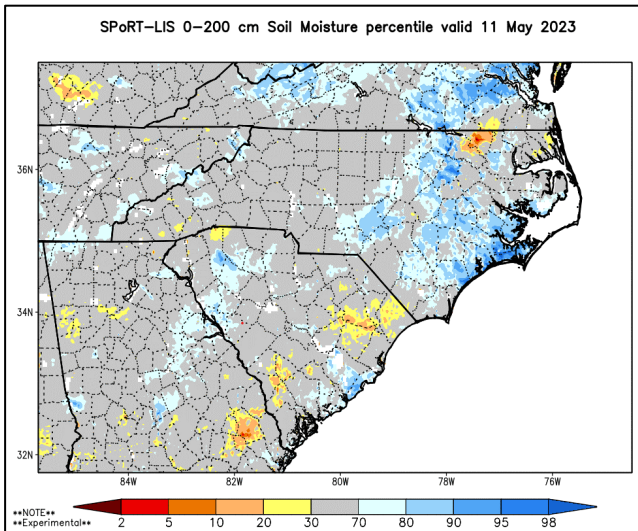
- Drought Conditions have been removed.
- ****However**, with active growing season, higher air temps and much increasing evaporative demands – this could rapidly change.
- 7-Day Stream flow averages have generally responded to rainfall influences in many areas.
- New River near Gum Branch (Onslow Co.) shows much below normal.

SPoRT Modeled Relative Soil Dryness

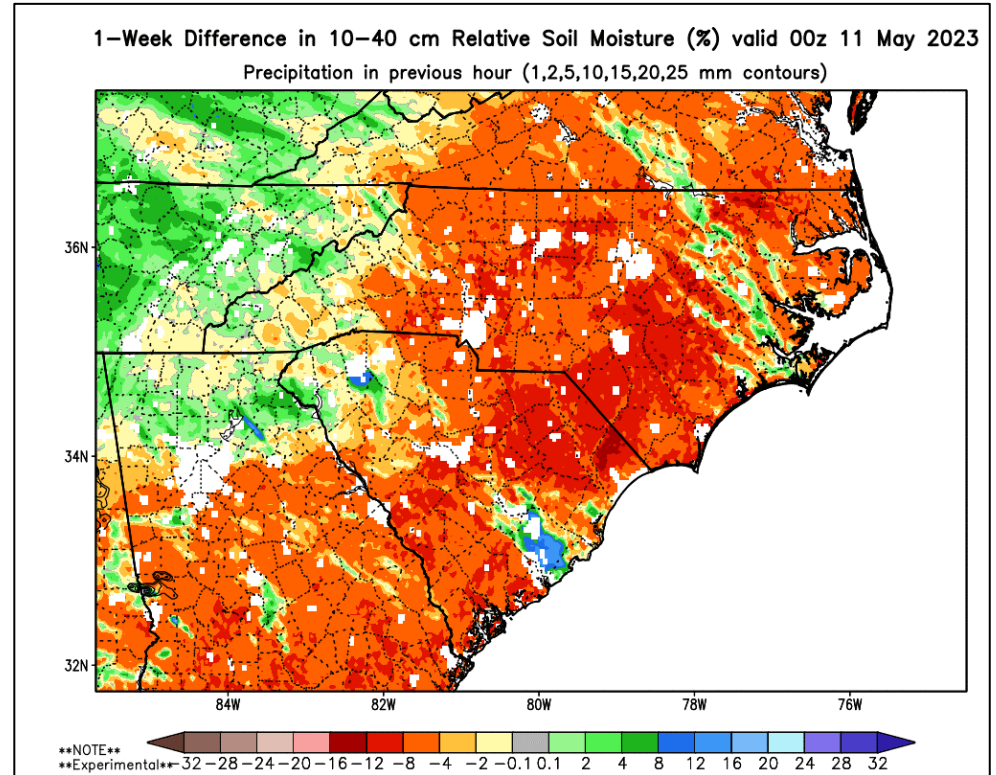
0-40 cm Depth



0-200 cm Depth

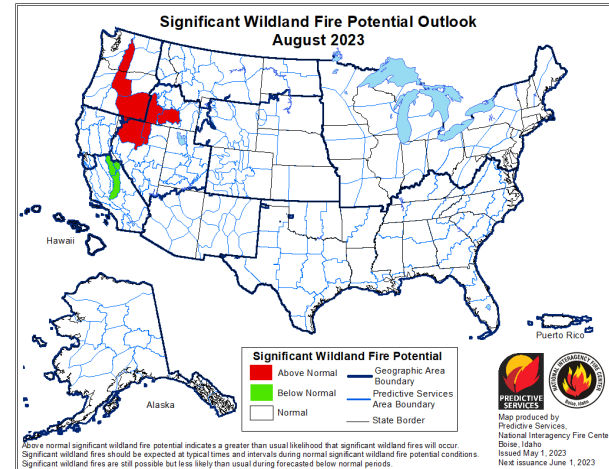
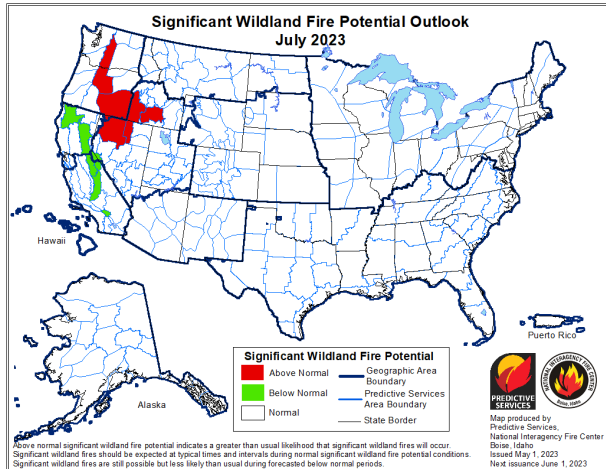
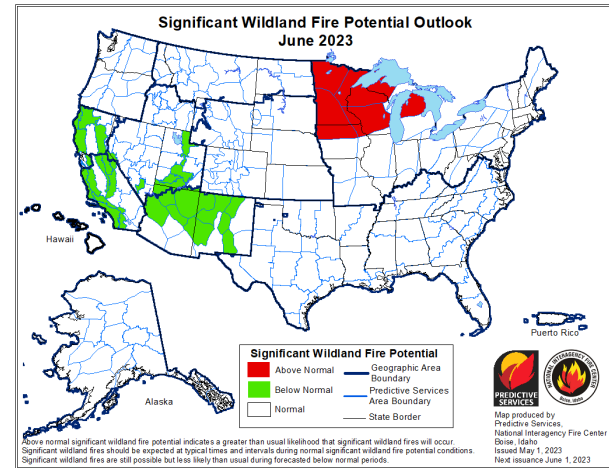
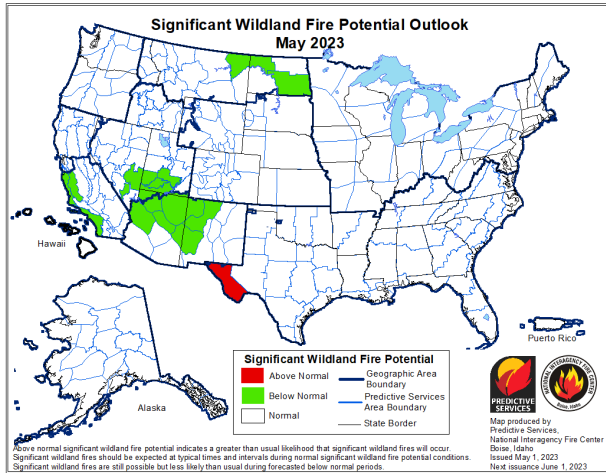


- Note the growing season influences along with thunderstorm rain impacts to modeled moisture.



Significant Wildland Fire Potential Outlook:

Updated 5/1/23 – Next Update on 6/1/23



A significant fire is one that requires resources from outside the district (other than aviation). IA potential is based more on shorter term weather factors. Just a few days of dry weather can increase IA activity considerably as we have seen this year.

ENSO Notes from the CPC (5/11/23 Update)

ENSO Alert System Status: **El Niño Watch**

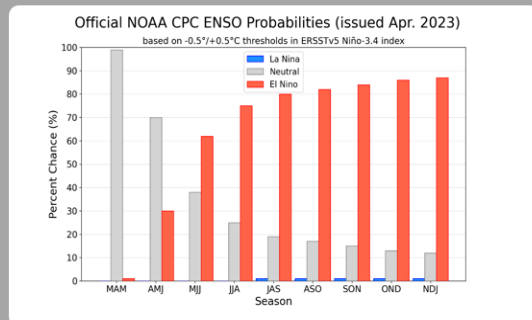
A transition from ENSO-neutral is expected in the next couple of months, with a greater than 90% chance of El Niño persisting into the Northern Hemisphere winter.

ENSO, or El Niño Southern Oscillation, is a fluctuation in the sea surface temperature (SST) in the equatorial Pacific Ocean. Research has shown that even slight changes in the SST, particularly in area 3.4, can influence weather in North America. Generally, when SSTs are lower than normal, known as La Niña, NC has drier than normal conditions and can have more fire occurrence. However, La Niña also can lead to more tropical activity. El Niño, on the other hand, usually means wetter weather for NC, but less opportunity for tropical landfalls due to increased wind shear. In order to declare a La Niña, the departure from average SST must be at least -0.5°C (line shown in green) for 3 consecutive months. For El Niño, the departure must be at least 0.5°C above average for 3 consecutive months.

CPC Probabilistic ENSO Outlook

Updated: 13 April 2023

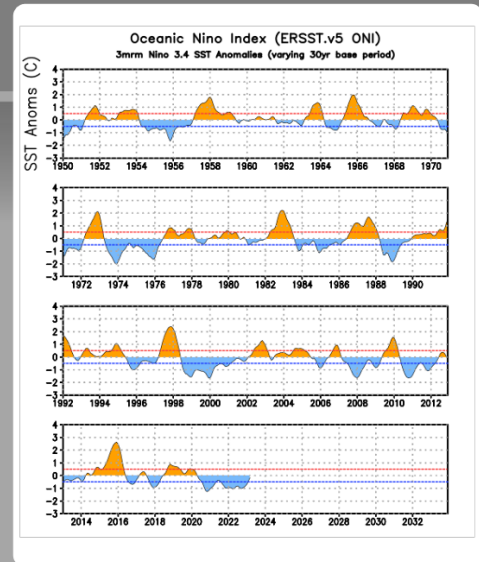
A transition from ENSO-neutral to El Niño is favored during May-July 2023, with chances of El Niño increasing through the fall and early winter 2023-24.



ONI ($^{\circ}\text{C}$): Evolution since 1950

The most recent ONI value (February - April 2023) is -0.2°C .

El Niño ↑
Neutral
La Niña ↓



Useful Daily Self-Briefing & Situational Awareness Links

Useful Daily Links:

Daily WIMS Observations and NFDRS Estimates

Averaged by FDRA SIG Group

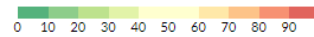
This is available on the FWIP at: <https://products.climate.ncsu.edu/fwip/nfdrs.php?data=ob&state=NC>

- The averaged values are derived from the SIG Station Outputs for a particular FDRA
(SIG station names shown in bold on the live link above)
- You can toggle the percentiles on/off, displaying below the actual calculated values
these percentiles are based on analysis of "All Days" for entire calendar year range through 2021 for these stations

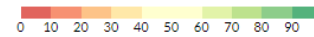
Daily Observations for 5/11/23

Averages by FDRA																		
FDRA	STATION_COUNT	NFDR_DATE	BI	ERC	IC	SC	KBDI	1HR	10HR	100HR	1000HR	HRB	WOODY	TEMP	RH	WIND	PRECIP	DUR
Southern Highlands	3	2023-05-11	33.83 59.5%	17.63 56.6%	3.00 51.9%	10.97 59.7%	80.00	14.14 50.9%	20.02 63.9%	18.38 31.0%	22.56 87.0%	155.27	135.00	66.7°F	67.0%	SE 1.7 mph	0.01 in.	0.3
Central Mountains	3	2023-05-11	33.63 60.0%	22.77 67.3%	4.50 70.9%	8.50 56.3%	107.33	11.93 35.9%	18.38 51.4%	18.17 34.3%	21.95 83.1%	235.63	190.00	77.0°F	39.7%	SE 3.7 mph	0.00 in.	0.0
Northern Highlands	2	2023-05-11	50.50 68.3%	22.65 69.6%	6.35 78.3%	21.40 65.9%	71.50	11.89 28.5%	18.11 49.9%	18.68 50.6%	21.58 80.1%	201.50	170.50	69.0°F	55.0%	E 9.0 mph	0.00 in.	0.0
Blue Ridge Escarpment	3	2023-05-11	47.10 62.0%	30.73 70.1%	6.13 61.4%	13.40 56.0%	117.00	11.28 37.1%	15.05 31.1%	17.04 23.5%	18.40 20.5%	190.33	159.67	77.3°F	47.3%	SSW 4.0 mph	0.00 in.	0.0
Western Piedmont	3	2023-05-11	38.80 50.9%	26.10 54.3%	4.70 49.6%	10.13 46.4%	108.00	12.11 55.3%	17.88 65.2%	17.40 33.5%	21.24 76.6%	159.53	137.67	80.3°F	45.7%	S 2.7 mph	0.00 in.	0.0
Sandhills	3	2023-05-11	36.03 48.9%	35.47 40.6%	9.03 54.9%	7.60 80.2%	128.00	10.55 46.1%	17.91 61.7%	17.45 25.7%	21.01 77.5%	144.97	131.33	83.0°F	37.0%	SSE 4.3 mph	0.00 in.	0.0
Eastern Piedmont	4	2023-05-11	48.00 24.4%	26.08 30.1%	6.25 42.0%	16.00 20.9%	84.25	11.68 51.1%	18.21 61.5%	17.94 39.7%	21.50 78.3%	165.35	146.00	77.5°F	45.0%	WSW 5.3 mph	0.00 in.	0.3
Southern Coastal	7	2023-05-11	36.30 29.4%	28.87 44.9%	5.87 52.4%	8.09 20.4%	234.43	10.35 22.6%	17.66 57.8%	17.76 30.4%	21.90 77.3%	250.00	194.43	81.3°F	39.0%	S 3.3 mph	0.00 in.	0.0
Northern Coastal	4	2023-05-11	42.58 30.7%	36.83 55.7%	5.85 48.0%	8.68 19.9%	262.00	10.61 36.6%	17.11 56.1%	17.71 38.0%	21.88 81.5%	173.98	135.50	80.8°F	38.0%	SSW 3.8 mph	0.00 in.	0.0

BI/ERC/IC/SC
Percentiles (%)
(based on all days through 2021)



Fuel Moisture
Percentiles (%)
(based on all days through 2021)



Useful Daily Links:

Daily WIMS Forecast Observations and NFDRS Estimates

Averaged by FDRA SIG Group

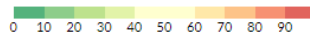
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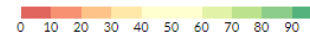
Daily Forecast for 5/11/23 (issued on 5/10)

Averages by FDRA																		
FDRA	STATION_COUNT	NFDR_DATE	BI	ERC	IC	SC	KBDI	1HR	10HR	100HR	1000HR	HRB	WOODY	TEMP	RH	WIND	DUR1	DUR2
Southern Highlands	3	2023-05-11	56.80 72.6%	23.10 71.1%	6.03 78.2%	25.97 70.9%	64.00	13.17 42.1%	18.29 50.6%	17.69 31.0%	22.49 76.3%	155.27	135.33	71.3°F	55.0%	SSE 7.3 mph	0.0	0.0
Central Mountains	3	2023-05-11	41.67 65.2%	20.00 59.8%	4.63 70.9%	15.37 62.9%	95.33	12.99 46.9%	19.28 59.7%	17.33 19.3%	21.85 83.1%	235.63	190.00	73.0°F	49.7%	SSE 8.0 mph	0.0	0.0
Northern Highlands	2	2023-05-11	43.40 65.3%	21.80 68.1%	4.75 73.3%	15.40 62.4%	63.00	12.67 37.9%	17.33 41.6%	18.28 35.9%	21.55 80.1%	201.50	170.50	69.5°F	50.0%	S 6.0 mph	0.0	0.0
Blue Ridge Escarpment	3	2023-05-11	48.80 63.3%	26.50 64.6%	5.53 61.4%	16.77 61.8%	104.33	12.24 46.8%	16.83 46.9%	16.59 23.5%	18.04 20.5%	190.33	160.33	75.0°F	46.0%	S 4.7 mph	0.0	0.0
Western Piedmont	3	2023-05-11	48.67 57.8%	27.03 56.2%	6.03 57.2%	15.73 56.7%	97.67	11.89 55.3%	17.63 65.2%	17.17 33.5%	21.17 76.6%	160.13	138.00	78.0°F	44.0%	S 4.7 mph	0.0	0.0
Sandhills	3	2023-05-11	34.17 43.6%	31.87 35.0%	7.23 44.7%	6.63 71.8%	115.67	11.77 56.8%	18.67 68.3%	17.58 40.5%	21.03 77.5%	146.17	132.67	79.0°F	38.0%	SE 5.0 mph	0.0	0.0
Eastern Piedmont	4	2023-05-11	43.38 22.2%	24.75 29.0%	5.30 36.2%	13.45 17.8%	74.25	12.07 51.1%	17.79 61.5%	17.97 39.7%	21.50 78.3%	165.90	146.25	77.0°F	43.8%	S 5.0 mph	0.0	0.0
Southern Coastal	7	2023-05-11	33.83 27.3%	24.59 37.6%	4.34 36.4%	8.01 20.4%	222.43	11.85 47.5%	17.95 57.8%	17.61 30.4%	21.80 77.3%	250.00	194.86	79.4°F	39.4%	SE 4.6 mph	0.0	0.0
Northern Coastal	4	2023-05-11	43.53 31.5%	29.95 43.5%	4.80 41.2%	11.45 23.3%	251.50	12.10 48.6%	17.49 56.1%	17.77 38.0%	21.87 81.5%	174.68	137.00	76.0°F	42.0%	SE 3.8 mph	0.0	0.0

BI/ERC/IC/SC
Percentiles (%)
(based on all days through 2021)



Fuel Moisture
Percentiles (%)
(based on all days through 2021)



Useful Daily Links:

Weekly Outlook - FDRA General Fire Danger Forecast Matrix:

- Available on the FWIP within the “[Resources for NCFs](#)” page.
- The operation link is: <https://products.climate.ncsu.edu/fwip/outlook.php>
- The matrix updates daily - please review the tool notes below for more details.
- For the 9 FDRAs in North Carolina

Weekly Outlook

Fire Danger Rating Area

Select a state: North Carolina Select an FDRA: Northern Coastal

Northern Coastal FDRA - General Fire Danger Forecast
 For planning purposes only; forecast is subject to change

Four or more RED blocks in a day signals the potential for a Critical Fire Day

DAY	THU 11-May	FRI 12-May	SAT 13-May	SUN 14-May	MON 15-May	TUE 16-May	WED 17-May
Avg. Max. Temp. (°F)	79	82	84	87	86	84	79
Avg. Min. Humidity (%)	40	44	50	56	55	44	46
Avg. 20' Wind Speed (mph)	6	7	9	9	8	9	9
Avg. Wind Direction*	S	SSW	SW	ESE	E	WSW	S
Avg. Probability of Precip. (%)	0	4	50	18	32	14	17
Days Since a Wetting Rain**	12.0	13.0	10.5				
Forecast EFC (Fuel Model X)	30.0	29.8	30.0	24.4	20.8	22.3	25.3
Forecast BI (Fuel Model X)	45.5	40.0	72.5	45.2	40.6	36.9	36.2
Forecast H (Fuel Model X)	4.8	7.1	9.2	4.7	3.4	3.4	4.3
Forecast 100-Hr. FMC	17.3	17.5	17.3	17.3	17.3	17.4	17.4
Forecast 1000-Hr. FMC (KBDI)	21.9	21.7	21.5	21.2	21.0	20.6	20.7
	251.5						

Data Source:

- Weather forecasts come from the National Weather Service's [Digital Forecast Database](#). The wind speed and direction and probability of precipitation are calculated as averages of the 3 am, 7 am, 1 pm, and 7 pm forecasts. The 20-foot wind speed is estimated from the 10-meter forecast using the log wind profile method.
- Days since a wetting rain is calculated using a combination of historical data to determine the most recent wetting rain event and forecasted precipitation amounts. These forecasted amounts are only available for the first three days of the forecast period.
- Fire danger forecasts for the next 7 days are issued by National Weather Service through WIMS. KBDI is only available on the first forecast day since the [NEDRS Forecast](#) product does not include precipitation amounts, which are used to adjust KBDI from day to day.

Values in the table above are averages from 4 stations in this FDRA:

- Elizabeth City (311503)
- Greens Cross (313001)
- Pocomin Lakes (315201)
- Fairfield (317901)

KEY	Low to Moderate Burning Conditions	Burning Conditions Can be High (CAUTION)	Burning Conditions Can be Critical (RED FLAG)
Avg. Max. Temp.	Less than 49°F	Between 49°F and 59°F	Greater than 59°F
Avg. Min. Humidity	Greater than 40%	Between 35% and 40%	Less than 35%
Avg. 20' Wind Speed	Less than 10 mph	Between 10 mph and 15 mph	Greater than 15 mph
Avg. Wind Direction*	Criticality of wind direction is highly dependent on burn operations and/or structures threatened.		
Days Since a Wetting Rain**	A wetting rain is defined as 0.10" or greater. This is an average of the FDRA stations noted above.		
Energy Release Comp.	Less than 39.2	Between 39.2 and 46.8	Greater than 46.8
Burning Index	Less than 78	Between 78 and 94.8	Greater than 94.8
Ignition Component	Less than 9.3	Between 9.3 and 12.8	Greater than 12.8
100-Hour Fuel Moisture	Greater than 17.7%	Between 14.8% and 17.7%	Less than 14.8%
1000-Hour Fuel Moisture	Greater than 18.5%	Between 17.5% and 18.5%	Less than 17.5%
KBDI	Less than 345	Between 345 and 443	Greater than 443

Other factors to consider when determining fire danger: sky conditions, precipitation amount, number of days since rain, and season

Tool Summary:

The forecast matrix was created using **standard NFDRS and weather forecast data:**

- Weather conditions and NFDRS outputs are forecasted over the next 7 days by NWS for SIG stations in each FDRA.
- Weather variable ranges and breakpoints were defined by FDRA stakeholders and relate to Pocket Card notes.
- Maximum temperatures in the Critical range are color-coded with shades of red to help visually distinguish daily variations. The brightest red color corresponds to temperatures of 100°F or greater.

Fire danger forecast indices and component values are grouped into three categories based on historical percentiles, assessed using the FF+ All Days filter through 2021:

- Low to Moderate (0 to 74th percentile); shown in blue-green
- High (75th to 89th percentile); shown in yellow
- Very High to Extreme (90th+ percentile); shown in red and labeled as Critical

Dead fuel moisture forecast values are grouped into three categories based on historical percentiles, assessed using the FF+ All Days filter through 2021:

- Low to Moderate (26th to 100th percentile); shown in blue-green
- High (11th to 25th percentile); shown in yellow
- Very High to Extreme (0 to 10th percentile); shown in red and labeled as Critical

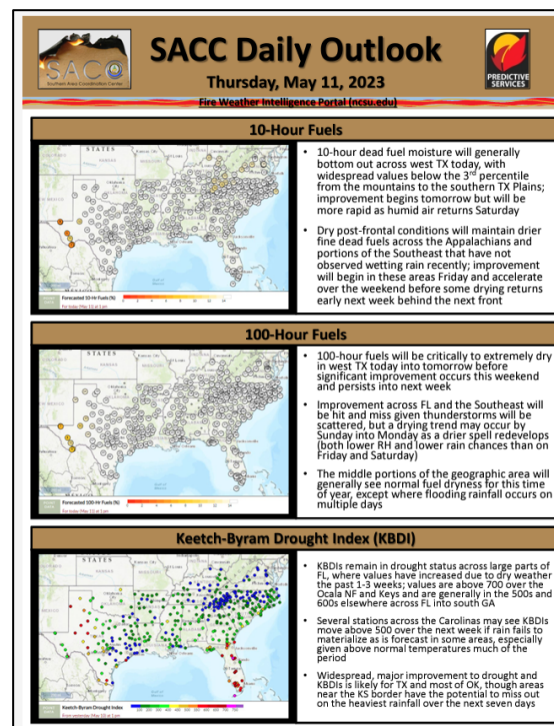
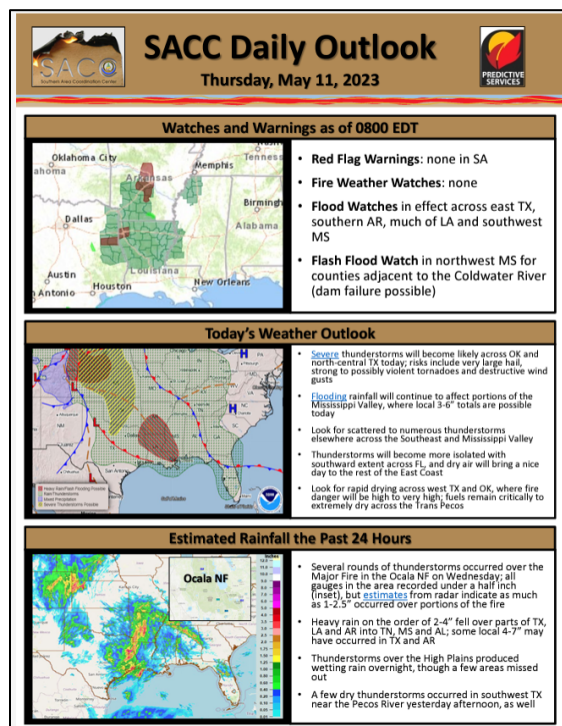
Other Notes:

- Read the key and notes for each FDRA, included on the outlook matrix page.
- Forecasts are variable and can change significantly over a forecast cycle and across the landscape.
- This is another tool for gaining better situational awareness, and should be used for general planning purposes only.
- The outlook matrix is refreshed when an FDRA is selected, using the most recent forecast data available at that time. The 7th day may drop off or display partial data prior to the afternoon/evening forecast update.
- Daily updates to NFDRS forecasts occur around 1530 daily, while general weather forecasts are updated around 1730 daily.

Useful Daily Links:

Southern Area Daily Outlook Page:

<https://gacc.nifc.gov/sacc/resources/predictive/sacc-daily-outlook.pdf>



Product is updated frequently (example images from 5/11 Outlook shown)

NC DAQ Air Quality Forecast - Next Three Days

The [North Carolina Division of Air Quality](#) issues forecasts for fine particulate matter year-round and ozone from March through October. Forecasts and discussions are updated each afternoon for the next three days, and are sometimes updated in the morning to reflect the latest ambient conditions.

View: The latest forecast discussion

The afternoon forecast discussion from

May 10, 2023

This forecast was issued on **Thursday, May 11, 2023 at 9:57 am.**

This forecast is currently valid.

Today's Air Quality Conditions

Current daily average and hourly particle pollution levels are elevated into the low Code Yellow across interior NC as forecast, while ozone levels currently are in the Code Green range statewide.

[For a display of the most recent Air Quality Index \(AQI\) conditions throughout the day, visit the Ambient Information Reporter \(AIR\) tool.](#)

General Forecast Discussion

Today, a noticeably more smoke-laden air mass is being analyzed across the region today than had been forecast by operational smoke guidance such as the HRRR smoke for today. As a result, and based on past precedence thus far this ozone season for rural locations to be reactive to smoke, we have decided to raise the ozone forecast statewide into the low to mid Code Yellow range. The particle pollution forecast remains on track and no changes are needed at this time.

Author: *McLamb*- NC Division of Air Quality

Extended Air Quality Outlook

The forecast Air Quality Index value for each pollutant represents the highest value expected within each county, so some areas and monitors may see lower values. We use the best information and techniques available to ensure the quality and accuracy of the forecasts we provide to the public. Note that ranges do *not* include the nine-county Triad region, which is covered by the Forsyth County Office of Environmental Assistance and Protection.

Forecast Day	AQI Range	Category Range
Thursday (May 11) 🌫️	50 to 74	Green to Yellow
Friday (May 12)	50 to 56	Green to Yellow
Saturday (May 13)	50 to 56	Green to Yellow

Update Summary:

Statewide Notes:

- Spring 2023 has seen normal overall activity (in statewide occurrence context)
 - Weather bumps helped create periods of very intense IA
 - Most notable example - 4/1 Wind Event (R3 Fire Activity)
 - 10 “209” Fires over 100 acres so far on state jurisdiction/reported fires
 - Including Last Resort Fire (5,280 ac.) in D13/Tyrrell
 - Also continuing to support the Great Lakes Fire (32,400 ac.) in D4/Craven-Jones at IMT3 Unified Command Level
 - Four Month Outlook - Normal Activity favored statewide (See Significant WF Potential Outlook Slides).
-

- ENSO Notes - in Neutral Conditions & forecast to transition to El Niño into Summer and likely persisting into Winter.
 - Beginning the transition to summer-like rainfall/thunderstorm pattern.
 - Hurricane Season begins June 1st.
 - Green-up conditions and subsequent benefits from shading and wind interception has helped transition much of the state into normal seasonal patterns of fire activity.
 - Pocosin/bay waxy leaf species continue to mature.
-

- Drought removal for now, from beneficial rains in April.
- However - with the state now in an active growing season, seeing higher temps and increasing evaporative demands – drought conditions can quickly redevelop, especially in localized areas that miss rainfall events.
- Note areas that have now exceeded ten days since ≥ 0.25 ” rain (see earlier slide) along with decreasing dead fuel moistures.
- If drought redevelops, especially in areas of organics, overall activity and mop-up demands will likely increase.
- “Lightning Season” concerns, especially on areas of drying organic soils or deep organic duff, have been noted.